Rule WLM136: DB2 activity processing transactions in service class

Finding: CPExpert has detected that a large percent of the transaction response time was related to DB2 activity involved in processing the transactions in the service class.

Impact: This finding means that transactions were waiting for DB2 thread activity.

Logic flow: The following rules cause this rule to be invoked:

Rule WLM104: Subsystem Service Class did not achieve average response goal

Rule WLM105: Subsystem Service Class did not achieve percentile response goal

Discussion: A transaction service class could be “served” by CICS regions, by IMS regions, by DB2 threads, or a combination of these. When a transaction service class misses its performance goal, CPExpert determines whether transaction delay information is available, from the view of these “server” subsystems.

When a transaction service class fails to achieve its performance goal, CPExpert analyzes the delay information to identify the primary and secondary causes of delay.

If the subsystem supports work manager delay reporting (that is, the subsystem is at CICS Version 4 or above, IMS Version 5 or above, or DB2 Version 6 or above), the delay information is available in the "Work Manager/Resource Manger State Section" of SMF Type 72 (Subtype 3) records. Field R723RTYP describes the subsystem that reports the transaction delay information (e.g., CICS, IMS, DB2, etc.).

With Version 6, DB2 uses the execution delay monitor services provided by the Workload Manager. These services are used to inform the Workload Manager about DB2's view of the current state of a work request or thread, such as *ready for execution* (active) or *waiting for execution* (suspended).

When a significant amount of transaction time is spent in DB2 (that is, R723RTYP = ‘DB2’), CPExpert examines the delay information reported by DB2. This Rule (Rule WLM136) reports the result of that analysis.

DB2 Version 6 reports transaction states in the following categories:

- **Active state**. The Active state means that the DB2 thread is ready for execution. Although the thread is marked as Active, a thread may be active only from DB2's point of view. The thread actually might be delayed due to a page fault, for CPU access, etc.

- **Waiting for I/O state**. The Waiting for I/O state means that DB2 had initiated some I/O operation and the thread was suspended waiting for I/O completion.

- **Waiting for Lock state**. The Waiting for Lock state means that the DB2 thread is suspended while DB2 is acquiring a lock.

- **Waiting for New Latch state**. The Waiting for Latch state means that the DB2 thread is suspended while DB2 is acquiring a latch.

- **Waiting for Network Delay state**. The Waiting for Network Delay state means that the DB2 thread is suspended while DB2 is waiting for a session to be established somewhere in the network.

- **Waiting for Miscellaneous Reasons state**. The Waiting for Miscellaneous Reasons state normally means that the work manager could not readily identify the cause of the waiting. With DB2 threads, this state often means that the DB2 thread is suspended waiting for a stored procedure to be scheduled (queuing for stored procedure).

CPExpert uses Rule WLM136 to report the time when a “served” transaction service class was served by DB2. The information is provided relative to the total subsystem samples for the transaction service class missing its goal. Thus, a CPExpert user can see the effect that DB2 activity and waiting has on the transaction response time.

The following example illustrates the output from Rule WLM136:

```
RULE WLM136: DB2 ACTIVITY IN SUPPORT OF SERVICE CLASS

   TENTHSEC: The following information shows the distribution of samples
   in DB2 for those periods when DB2 accounted for a significant part
   of the response time of the TENTHSEC Service Class.  The percentages
   are relative to the total samples for the TENTHSEC Service Class.

                       PCT DB2  --PERCENT OF SAMPLES DB2 WAS WAITING---
   MEASUREMENT INTERVAL  ACTIVE  I/O  LOCK  LOCSES  PLXSES  NETSES  MISC
   13:29-13:44,14MAR2001  14.8  23.5   0.0    0.0     0.0     0.0    7.8
   13:44-13:59,14MAR2001   8.2   6.6   0.0    0.0     0.0     0.0    6.6
   13:59-14:14,14MAR2001   3.5   2.6   0.0    0.0     0.0     0.0    1.7
```

Suggestion: There are no suggestions with this finding. CPExpert will continue analysis and other rules may be produced to provide more information. Please refer to Rule WLM104 or Rule WLM105 for information about the causes of delay to the subsystem transaction service classes.

Reference: DB2 UDB for OS/390 Version 6 Performance Topics Redbook (SG24-5351-00)

